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REPORT
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TO THE
DIRECTORS
OF THE
WHITE MOUNTAINS RAIL-ROAD,
JULY, 1849.

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ENGINEER

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REPORT.

OFFICE OF THE WHITE MOUNTAINS RAIL ROAD, }
Bath, July 13, 1849. }

To the Directors of the White Mountains Rail Road:

GENTLEMEN: I lay before you Plan and Profile of the route surveyed for the WHITE MOUNTAINS RAIL ROAD; and estimates of its Construction and Furnishing.

The Line commences at a point on the definitive survey of the Connecticut and Passumpsic Rivers Rail Road in Wells River Village, Newbury, Vt., about one hundred and fifty feet South of Wells River; and crossing that stream, passes Easterly one thousand feet on a curve of about 800 feet radius to the Connecticut River Bluff, and crosses the River 60 feet Northerly of the old Ferry way; thence passes to Woodville in Haverhill, where it meets the Northern terminus of the Preliminary Survey of the route for the Boston, Concord and Montreal Rail Road, a distance of twenty-two hundred and fifty feet from point of beginning.

From this point the Line continues in the immediate valley of the Ammonoosuck, making two crossings of the stream at Harris's bend, passing near his house; and again crossing a short distance below the mouth of Wild Ammonoosuck; and passes near the Westerly end of Bath Village bridge, a distance of four miles from Woodville. Again crosses the river a short distance below the farm-house of Hon. A. Woods; passes Easterly of, and near the house of Z. Newell, Esq.; crosses Mill Creek in Landaff on Westerly side of the Mills; and passes Lisbon Village between Main street and the River, a distance of 9 1-2 miles from Woodville. Thence continues on Easterly bank, passing in rear of Elliots'; crossing Salmonhole Creek near the Mill-dam, and South branch Ammonoosuck near its junction with Main stream, to Littleton Village, a distance of 19 3-4 miles from Woodville.

From this point two routes are surveyed to Clifford's bend in Bethlehem; the Westerly crossing the Ammonoosuck a short distance Northerly of Littleton Village bridge, and continuing on Westerly side of River; the Easterly making two crossings of the stream at Bowman's bend and passing on Easterly bank at Scythe Factory, and again crossing near Clifford's house.—Thence the Line continues on Westerly side of River passing on Easterly side of Alderbrook Mills, and at point of bluff, on Westerly side of Rand's Mills in Bethlehem, to the junction of Wing road with the River road; where it passess from the Ammonoosuck and following up the valley of Pine Log Creek, attains the summit in Whitefield a distance of 27 miles from Woodville.

Thence passes Easterly of Montgomery's Pond, and near Burn's Mills at its outlet; crosses Little River a short distance in rear of the house of J. M. Gove, Esq., and John's River on Westerly side of Starch Factory at Whitefield Village, a distance of 30 2-3 miles from Woodville. Thence continues on Easterly slope of the valley of John's River passing a little Westerly of Capt. Smith's house in Dalton; and keeps in vicinity of common road to Scott's, passing Westerly of his house and Easterly of Taylor's into Lancaster; and approaches the Connecticut River about half a mile Southerly of Benton's and passing on Westerly side of the house and about 500 feet Easterly of the house of Hon. J. M. White, and near school-house; passing over the intervale and crossing Israel's River near Lancaster Village—terminates on Main street near the Churches and Cemetery, at the Southern terminus of the Preliminary Survey of the route for the Lancaster Branch of the Atlantic and St. Lawrence Rail Road, a distance of 41 1-2 miles and 26 feet from its junction with Line of Boston, Concord and Montreal Rail Road in Woodville; and 41 3-4 miles and 956 feet from its point of starting on Line of the Connecticut and Passumpsic Rivers Rail Road.

Examination was made for a more direct route leaving the immediate valley of the Ammonoosuck, from Littleton Village to "Wing Road" in Bethlehem, but without success. Also to leave at Alderbrook Creek in Bethlehem and pass by Round Pond to valley of John's River, but without discovering a favorable pass from the valley of the Ammonoosuck to the Pond.

The route is favorable for the construction of a Rail Road. Except at very few points as the Profile shows, the work will be regarded as *very light*. But little Rock cutting, and very few *slide cuts* will be encountered. At but three or four points, does

the Line run so near the River, as to require protection for the embankment. The Bridge sites are quite favorable; the abutments in many instances, as at the crossing of the Connecticut, to be placed on rock above the reach of high water; and in no case will there be an expensive abutment or arch foundation.

As to Curvature the route will compare favorably with New England Rail Roads. In but few instances will there be necessity of adopting curves of shorter radius than 1273 feet. In a very few cases curves of 1000 feet radius will be used.

The summary of Grades stands thus:

4,20	miles of	44,88	feet the mile.
3,75	"	42,24	" "
4,50	"	36,96	" "
1,83	"	31,68	" "
4,50	"	26,40	" "
5,25	"	21,12	" "
5,00	"	7,5 to 19,0	" "
12,90	"	Level Grade.	

The Level of surface of water in the Connecticut River at Wells River Bridge was assumed as Base. It will be seen that the Whitefield Summit is 650 feet above base, and the Terminus at Lancaster 453 feet. The maximum Grade occurs on both sides of the Summit. The Bridges will be eight in number—the Connecticut, five across the Ammonoosuck, the South branch, and Israel's River. Arches will be put in at Little and John's Rivers. If the Easterly Line from Littleton village to Clifford's is taken, the Ammonoosuck will be turned at Bowman's bend. Passing around Harris's bend in Bath and thereby increasing the length of Line about one-fourth of a mile, will reduce the number of bridges to six.

At Wells River, an additional length of the Arch for the Passumpsic Rail Road is estimated.

In the estimate a width of 15 feet road-bed is assumed for Embankments, and 20 feet for Excavations. Slopes 1,5 horizontal to 1 vertical.

The assumed weight of Rail is 52 lbs. the yard. Sleepers, 6 by 7 inches, 8 feet in length; 7 in number to one length of 18 feet Rail. Chairs 12 lbs. each.

**ESTIMATE FROM PASSUMPSIC LINE TO WOODVILLE,
DISTANCE, 2350 FEET.**

22,400 yds. Earth, at 18 cts.,	- - - - -	\$4,032
450 " Rock, at \$1,00,	- - - - -	450
Wells River Bridge,	- - - - -	2,500
1,250 yds. Conn. Br. Mas. at \$5,	- - - - -	6,250
Bridge 360 feet at \$40,	- - - - -	14,400
		\$27,632

**WOODVILLE TO LITTLETON, DISTANCE 19.75
MILES.**

395,600 yds. Earth at 16 cts.,	- - - - -	\$63,296
7,900 " Rock " \$1,00,	- - - - -	7,900
1,800 " Slope Wall at \$1,00,	- - - - -	1,800
2,970 " Culvert Mas. at \$2,00,	- - - - -	5,940
3,300 " Bridge, " \$3,50,	- - - - -	11,550
5 Bridges, 700 feet at \$18.	- - - - -	12,600
		\$103,086

**LITTLETON TO LANCASTER, DISTANCE 21.75
MILES, 26 FEET.**

598,700 yds. Earth, at 16 cts.,	- - - - -	\$95,792
13,500 " Rock, " \$1,00,	- - - - -	13,500
1,300 " Slope Wall, at \$1,00,	- - - - -	1,300
3,770 " Culvert Mas. at \$2,00,	- - - - -	7,540
3,900 " Bridge, " \$3,50,	- - - - -	13,650
2 Bridges 250 feet at \$17,	- - - - -	4,250
		\$136,032

FOR ONE MILE SUPERSTRUCTURE.

82,5 Tons Iron at \$50, - - - - -	\$4,125,00
2054 Sleepers, at 15 cts., - - - - -	308,10
7041 lbs. Chairs, at 3,5 cts., - - - - -	246,44
4693 " Spikes " " " - - - - -	164,26
Laying Track, - - - - -	400,00
	\$5,243,80

41,93 miles, - - - - -	\$219,872,53
Turnouts and Incidental, - - - - -	19,105,47
Total for Superstructure, - - - - -	\$238,978,00

Land damage, - - - - -	\$30,000
Fencing, - - - - -	18,750
Total Land and Fence, - - - - -	\$48,750

FURNITURE.

5 Locomotives at \$7500, - - - - -	37,500
5 Passenger Cars, - - - - -	10,000
Freight, Platform and other Cars, - - - - -	40,000
Depots, Water Stations, &c., - - - - -	61,000
Amounting to - - - - -	\$148,500

SUMMARY.

Grading, - - - - -	\$184,970
Masonry, - - - - -	50,530
Bridges, - - - - -	31,250
Superstructure, - - - - -	238,978
Land and Fence, - - - - -	48,750
Furniture, - - - - -	148,500
Engineering and Incidental, - - - - -	25,000
	\$727,978

Respectfully submitted,

J. L. GREGG, *Engineer.*